WHAT CLAIMED IS:

1. A multi-stage compression type rotary compressor comprising:

a sealed vessel;

an electrical-power element having a rotary shaft; and

a first rotary compression element and a second rotary compression element driven by the rotary shaft of the electrical-power element, wherein the electrical-power element and the first and second rotary compression elements are arranged in the sealed vessel,

wherein a refrigerant compressed by the first rotary compression element is compressed by the second rotary compression element, and

wherein the refrigerant comprises a combustible refrigerant, and the refrigerant compressed by the first rotary compression element is discharged into the sealed vessel, and the discharged refrigerant is under a medium pressure and is further compressed by the second rotary compression element.

2. The rotary compressor according to claim 1, wherein a displacement volume ratio of the second rotary compression element to the first rotary compression element is set large.

3. The rotary compressor according to claim 1, wherein a displacement volume ratio of the second rotary compression element to the first rotary compression element is set not less than 60%.

4. The rotary compressor according to claim 1, wherein a displacement volume ratio of the second rotary compression element to the first rotary compression element is set not less than 60% and not more than 90%.

5. The rotary compressor according to claim 1, wherein a displacement volume ratio of an existing space of the refrigerant to a volume of the sealed vessel is set not less than 60%.

6. The rotary compressor according to claim 5, wherein a first cylinder and a second cylinder constructing the first and second rotary compression elements, a first support member and a second support member blocking each opening face of the cylinders and serving also as a bearing for the rotary shaft, and an intermediate partition plate arranged between the cylinders are shaped close to an inner surface of the sealed vessel.

7. The rotary compressor according to claim 1, comprising:

a first cylinder and a second cylinder constructing the first and second rotary compression elements;

a first roller and a second roller rotating eccentrically with eccentric portions provided on the rotary shaft of the electrical-power element;

a first vane and a second vane in contact with the rollers to divide the each cylinder into a low-pressure chamber side and a high-pressure chamber side; and

a first back pressure chamber and a second back pressure chamber for constantly urging the each vane on a side of the roller,

wherein the discharged medium pressure refrigerant is compressed by the second rotary compression element, and a discharge side of the refrigerant in the second rotary compression element communicates with the first and second back pressure chambers.

8. The rotary compressor according to claim 7, comprising:

a support member blocking an opening face of the second cylinder;

a discharge-muffler chamber formed in the support member for discharging the refrigerant compressed in the second cylinder;

a communication path formed in the support member and communicating with the discharge-muffler chamber and the second back pressure chamber; and

an intermediate partition plate sandwiched between the first and second cylinders,

wherein a communication hole for communicating with the second and first back pressure chambers is formed in the intermediate partition plate.

9. The rotary compressor according to claim 8, comprising:

a pressure equalizing passage communicating with the discharge-muffler chamber and the sealed vessel; and

a pressure equalizing valve opening or closing the pressure equalizing passage,

wherein the pressure equalizing valve opens the pressure equalizing passage when a pressure inside the discharge-muffler chamber is lower than a pressure within the sealed vessel.

10. A multi-stage compression type rotary compressor comprising:

a sealed vessel;

an electrical-power element having a rotary shaft;

a first rotary compression element and a second rotary compression element driven by the rotary shaft of the electrical-power element, wherein the electrical-power element and the first and second rotary compression elements are arranged in the sealed vessel, and a refrigerant compressed by the first rotary compression element is compressed by the second rotary compression element, and the refrigerant comprises a combustible refrigerant, and the refrigerant compressed by the first rotary compression element is discharged to the sealed vessel, and the discharged refrigerant is under a medium pressure and is further compressed by the second rotary compression element; and

a pressure equalizing valve for communicating with the discharge side of the refrigerant in the second rotary compression element and the sealed vessel when a pressure at a discharge side of the refrigerant in the second rotary compression element is lower than a pressure in the sealed vessel.

11. The rotary compressor according to claim 10, comprising:

a cylinder constructing the second rotary compression element;

a support member blocking an opening face of the cylinder;

a discharge-muffler chamber formed in the support member and discharging the refrigerant compressed in the cylinder;

a cover dividing the discharge-muffler chamber and the sealed vessel; and

a pressure equalizing passage formed in the cover,

wherein the pressure equalizing valve is arranged inside the discharge-muffler chamber to open or close the pressure equalizing passage.

12. A multi-stage compression type rotary compressor comprising:

a sealed vessel;

an electrical-power element having a rotary shaft;

a first rotary compression element and a second rotary compression element driven by the electrical-power element;

a first cylinder and a second cylinder constructing the first and second rotary compressor elements; and

a first roller and a second roller eccentrically respectively revolving within the cylinders at a first eccentric portion and a second eccentric portion provided on the rotary shaft with a phase difference therebetween, wherein the electrical-power element, the first and second rotary compression elements, and the first and second rollers are arranged in the vessel,

wherein a refrigerant compressed and discharged by the first rotary compression element is sucked into, compressed and then discharged by the second rotary compression element, and

dimensions of the first and second eccentric portions are same, dimensions of the first and second rollers are same, and dimensions of the first and second cylinders are same, and

the second cylinder is expanded outwardly from a suction port in a range of a predetermined angle in a rotation direction of the second roller.

13. A setting method of displacement volume ratio for a multi-stage compression type rotary compressor, comprising an electrical-power element, first and second rotary compression elements driven by a rotary shaft of the electrical-power element, first and second rollers respectively eccentrically revolving within the cylinders at a first eccentric portion and a second eccentric portion provided on the rotary shaft with a phase difference therebetween in a sealed vessel, wherein a refrigerant compressed and discharged by the first rotary compression element is sucked and then compressed and discharged by the second rotary compression element, wherein the method comprising:

constructing the first and second eccentric portions, the first and second rollers, and the first and second cylinders, wherein dimensions of the first and second eccentric portions are same, dimensions of the first and second rollers are same, and dimension of the first and second cylinders are same; and

setting a displacement volume ratio of the first and second rotary compression elements by expanding the second cylinder outwardly from a suction port in a range of a predetermined angle in a rotation direction of the second roller to adjust a compression-starting angle of the second rotary compression element.